

Applicant: Heikki Vatanen et al.
Application No.: 10/598,181
Response to Office action mailed Oct. 19, 2009
Response filed December 3, 2009

Remarks

Claims 11, and 13–23 remain pending in the application. In the Office action dated Oct. 19, 2009, claims 11, 14, 15, 19, 21, and 22 were rejected as obvious over Nakamura et al. (JP90) in view of Arai (JP 05-104062). Claim 12 was rejected as obvious over Nakamura (JP 06-142590) in view of Arai and further in view of Chino et al. Claims 13 and 20 were rejected as obvious over Nakamura in view of Arai and further in view of Kustermann. Claims 17–18 were rejected as obvious over Nakamura in view of Arai and further in view of Okada et al. (JP17). Claims 16 and 23 were rejected as obvious over Nakamura in view of Arai and further in view of Kondo et al. and Yapel et al.

Claims 11, 14, 15, 19, 21, and 22

Nakamuran describes a coating process which, although not limited to photographic emulsions which are placed on film or paper, comes from this technology see [0019]. It is important that all the contents of a reference be considered, thus the transferability of the disclosed technology to paper and board coating generally must be considered in the obviousness analysis. Applicant has amended the claims to clearly distinguish over Nakamuran, limiting the claims to a so-called curtain coater where the coating layers fall from a feeding lip in a curtain of coating onto an underlying paper or board web. The claims now also clearly indicate superpositioned layers are formed having thicknesses which are controlled by adjusting coating flows in the cross machine direction. Nakamuran does not employ a curtain coater where the coating material falls in a curtain, and does not suggest adjusting the thickness of the coating layers in the cross machine direction, but rather only adjusting the amount of coating flowing to each layer see 7a–7d in FIG. 1. Thus Nakamuran not only “*does not explicitly teach wherein the thickness data collected is a cross machine direction thickness profile*” as the examiner indicated, it also does not suggest in any way, or show any structure for cross machine direction profiling of the coating layers.

Arai shows a curtain coater but does not show multiple superpositioned layers which are built upon the surface of a flow plane, which subsequently fall over a lip to form the curtain. Arai shows controlling the cross machine direction thickness profile of the single

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layer coating based on thickness measurements made by light absorbed or scattered by the falling film, but is without any suggestion how this could be made to work on a multilayer film to control the thickness of each layer. Missing from the combination of references is any suggestion for doing what applicant has done: create a multilayer coating where each layer thickness is monitored in the cross machine direction and profiled in the cross machine direction. And whereas Nakamuran could be used to determine the cross machine direction profile of the coating layers, there is no suggestion for doing so, with respect to profiling the layers there is no suggestion and no mechanism shown which is capable of profiling the claimed superpositioned layers.

Chino et al (US 4,937,093) describes a magnetic recording tape where the thicknesses of two layers are controlled by the proper selection of at least one element in the compounds which are coated which can be distinguished and monitored by fluorescent x-ray analysis. The examiner cites Chino et al as also teaching the thickness control of multiple layers of material coating a web, which is no more than is taught by Nakamuran, and then concludes that it would be obvious "to have determined a cross machine direction thickness profile for each coating layer as the thickness data gathered and based on controlling in the method of Nakamura in view of Arai as such data would provide form more uniform surfaces and subsurfaces resulting in more predictable layer properties and greater control over the deposited film." However, Nakamura and Chino et al. do not suggest measuring a cross machine direction profile in each or any layer, nor show a mechanism by which a cross machine direction profile might be adjusted in each of the layers. Arai, which does show cross machine direction measuring and profiling, does not suggest that this be done in a multilayer coating, much less how it might been done. There is a complete absence of any suggestion to do what applicant has done, and consequently of any expectation it can be done.

There must be clearly articulated reasons why applicant's claimed invention is obvious, it is not sufficient to go as far as the prior art suggests and simply conclude that the steps not shown by the prior art are obvious. See the exemplary rationale set forth in MPEP 2143.

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Claims 17–18

The arrangement of Okada, as is made clear by the Abstract and FIG. 3, is used for the a cross machine direction control of the width of the coating. This is clearly distinct from the claimed profile control. There is no suggestion or discussion of using the control structures of Okada for any purpose except to control the width of the coating applied to the web. It is further to be noted that the valves 66 of Okada cannot be used as claimed to control a plurality of coating layers because the valves are not capable of functioning in groups which would control multiple layers.

Claims 13 and 20

Kustermann does not teach or suggest controlling the bypass flow as part of a system for controlling multiple layers of a coating.

Claims 16 and 23

Kondo teaches controlling edge flow by adding additional coating to the edges and Yape teaches using depth measuring devices or using a flow model to determine depth on the coating. There is no explicit statement directly instructing measurement of coating surface velocity in order to determine coating thickness. There is only a general discussion that there is a relationship between coating flow rates and thickness. This much is conceded in applicant's own discussion on the derivation of an equation describing relationship between surface speed and film thickness in paragraph [0032] of the specification. But invention is not negated because the claims can be used to mine the prior art in search of the concepts applicant has employed in his invention, rather the examiner's task is to present a rationally articulated reasoning why applicant's invention would be obvious to a person of ordinary skill in the art.

Applicant believes that no new matter has been added by this amendment.

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Applicant submits that the claims, as amended, are in condition for allowance.
Favorable action thereon is respectfully solicited.

Respectfully submitted,



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